

Maximizing the Treatment of Overactive Bladder in the Elderly

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Overactive bladder syndrome affects millions of elderly people in the United States and is equally prevalent in men and women. Its impact on quality of life can be devastating, especially to elderly patients with other medical comorbidities. In order to maximize care, health care providers must be able to make the correct diagnosis and have a working knowledge of available therapies. Data exist supporting the efficacy and safety of nonpharmacologic and pharmacologic therapies.

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Overactive bladder syndrome (OAB) is a constellation of lower urinary tract symptoms, including urinary urgency, with or without urge incontinence, usually associated with frequency and nocturia.¹ OAB is a chronic, debilitating condition that affects people of all ages, although it is much more prevalent in the elderly.²

Overactive bladder syndrome may have a deleterious effect on every aspect of daily life, including impaired mobility, social isolation, impaired work-related productivity, depression, disturbed sleep, and impaired domestic and sexual function.³ Its negative impact is potentially more pronounced in the elderly, a population already impaired by other medical comorbidities.

The importance of maximizing the treatment of OAB in the elderly, striking the best balance between efficacy, tolerability, and safety, should not be underestimated. In order to do so, one must be able to make the correct diagnosis and have a working knowledge of available therapies. In this article, the evaluation of patients with OAB is reviewed, and clinical tips especially relevant to the elderly population are provided. In addition, important data demonstrating the effectiveness of antimuscarinic agents and behavioral therapies in older patients are presented.

The Scope of the Problem

Prevalence

The National Overactive Bladder Evaluation (NOBLE) study was a large-scale community-based survey

Quality of Life

Overactive bladder can have a devastating impact on quality of life, with fear of wetting accidents leading to social isolation and depression.⁷ Patients may become increasingly reluctant to leave home, severely limiting independence and potentially increasing their incident disability secondary to lack of physical activity.⁸

Recurrent urinary tract infections and urinary dermatitis are more prevalent among patients with urge incontinence versus those suffering from other symptoms of OAB or controls.⁹ The risk of falls and associated nonspine fractures is significantly increased by the presence of urge incontinence, presumably occasioned by urge-motivated haste in attempting to reach the bathroom or toilet.¹⁰ Falls and fractures can, in turn, lead to serious declines in health status in

those on fixed incomes, these additional costs can be exceptionally burdensome.

Underdiagnosis

Overactive bladder syndrome is vastly underreported by those who suffer from it. Many patients live in silence, either because they are embarrassed or because they mistakenly believe that OAB is a normal consequence of aging or of having children. In a survey of men and women aged 40 to 74 years with symptoms of OAB, 40% had not spoken to a health care provider about their symptoms.^{14,15} In addition, many women use a number of coping strategies, including restroom mapping, wearing pads or diapers, and wearing dark clothing, rather than discussing their condition with their doctor.¹⁵

A number of obstacles also limit many physicians from aggressively screening patients for OAB. In a recent survey, 91% of 1013 health care providers agreed that urge urinary incontinence had a severe negative impact on patients' daily lives, but only 31% of primary care providers reported that they always inquired about the condition.¹⁶ The demands of a busy practice often compel physicians to prioritize other more acute and important medical problems, and many are embarrassed or uncomfortable discussing the condition. The author believes that many of the patient and physician barriers that do exist are even more pronounced in the elderly population.

Office-Based Workup

The office-based workup of elderly patients with symptoms of OAB in a primary care setting should include a complete medical history and physical examination, as well as a urinalysis.¹⁷ Optional tests that can be especially helpful in older patients include a voiding diary and measurement of the

The economic cost associated with overactive bladder is substantial, not only to the individual patient, but to health care systems.

that measured the prevalence and burden of overactive bladder in the United States and assessed variations in prevalence by sex, age, and other demographic factors.⁴ According to the NOBLE study, the prevalence of OAB is 16.9% in women and 16.0% in men; the prevalence increases with age, with estimates of about 30% in those 65 years of age and older. Based on the 2000 US Census, this is equivalent to approximately 10 million individuals.⁵ The prevalence of urinary incontinence among elderly patients who reside in long-term care facilities is as high as 50%, and in many cases the condition was the cause for admission.⁶ Unfortunately, the high prevalence of OAB in the elderly has propagated the popular myth that it is a normal consequence of aging.

older patients, sometimes requiring in-home or nursing facility care during recovery.¹¹ Frequent nocturnal voids resulting in sleep disturbances can dramatically impair daytime function, especially in older individuals.¹²

Economic Impact

The economic cost associated with overactive bladder is substantial, not only to the individual patient, but to health care systems. The total economic cost of urinary incontinence in the United States in 1995 for persons aged 65 years and older has been estimated to be \$26.3 billion, or \$3565 per person affected.¹³ Much of the cost (\$11.4 billion) was due to routine care—that is, the use of pads and reusable briefs, as well as laundry costs from cleaning clothing and bedding. For elderly patients, especially

postvoid residual urine volume. More sophisticated tests, commonly used by specialists in the evaluation of patients with voiding dysfunction, are urodynamics and cystoscopy. There are a number of clinical tips that are important to be aware of in order to make an accurate diagnosis and to maximize therapy.

History

A detailed history is the most important aspect of the clinical evaluation of elderly patients with overactive bladder. Patients with OAB commonly report urgency, with or without urge incontinence, often associated with frequent urination during the day or night. This differentiates patients with OAB from those with stress incontinence who leak urine during Valsalva maneuvers (such as coughing, sneezing, bending, and lifting) and with activity.

Though many health care providers are aware of the symptoms of overactive bladder, most physicians are not familiar with other common presentations, such as “bladder spasms” or involuntary bladder contractions, that may also be present in patients with OAB (Table 1). These other voiding dysfunction symptoms are especially common in older patients with OAB, and may make the history confusing.

Many older patients report incontinence not associated with urgency or Valsalva maneuvers. They can be

standing or sitting quietly and leak urine without warning; the first thing they experience is wetness. The author refers to this type of leakage as *unconscious incontinence* (a term not recognized by the International Continence Society). The differential diagnosis of unconscious incontinence is overflow incontinence (rare, and diagnosed by measuring the postvoid residual urine volume), severe urethral insufficiency (these patients will also report and demonstrate severe stress incontinence), and involuntary bladder contractions that the patient does not feel as urgency. The latter is especially common in patients who are frail and elderly.

High volume or flooding incontinence is either due to bladder overactivity or severe stress incontinence. Urine that “just runs down the leg” is most commonly due to an involuntary bladder contraction or overactive bladder. Many elderly patients suffer from enuresis, and in the majority of cases it is due to an involuntary bladder contraction. Incontinence during intercourse is very distressing and can be due to either stress incontinence or OAB. If a patient leaks with each thrust of her partner she likely has stress incontinence and, perhaps, a cystocele. If a woman leaks during intercourse and, importantly, even after her partner withdraws, an involuntary bladder contraction has likely been triggered.

Commonly, the symptoms of OAB and urge incontinence are triggered by certain factors or events. The sound of running water, walking by the cold section in the supermarket, and going from a sitting to a standing position are common triggers of urgency. Many patients experience urgency when they enter their driveway or insert a key into the door. Foot-on-the-floor syndrome is common and often confused with stress incontinence—patients wake at night

with urgency and leak “all the way to the bathroom” because of an involuntary bladder contraction and not because of a weak pelvic floor or urethral sphincteric mechanism.

Other aspects of the history are important when evaluating elderly patients with overactive bladder. Obstructive voiding symptoms (hesitancy, poor flow, straining, a feeling of incomplete emptying) are more common in men with benign prostatic hyperplasia (BPH), but may also be reported in patients with OAB. Obstructive symptoms in patients with OAB are often a result of frequent small volume voiding because urinary flow rates are highly dependent on volume voided.

Incontinence that appears during an illness or specific medical problem is referred to as *transient* (or *acute*) *incontinence*. Transient incontinence is often more common in debilitated and elderly patients and often responds to management of the underlying acute condition. In many cases, the acute event or condition “tips the balance” and aggravates an already existing chronic incontinence problem or bladder dysfunction. The mnemonic DRIP (Table 2) prompts the clinician to search for the causes of transient incontinence.¹⁸

Polypharmacy is especially common in the elderly. A number of medications can cause urinary symptoms or

Table 1
Other Presentations of Involuntary Bladder Contractions

- Incontinence not associated with urgency or Valsalva maneuvers
- Flooding incontinence
- Enuresis
- Incontinence during intercourse

Table 2
Causes of Transient Incontinence

- D Dehydration, delirium, diapers
- R Retention, restricted mobility
- I Infection, inflammation (atrophic vaginitis/urethritis), impactions (fecal)
- P Polypharmacy, polyuria (hyperglycemia, hypercalcemia)

Adapted with permission from Kane R et al.¹⁸

aggravate an underlying bladder disorder. The most clinically relevant offenders of overactive bladder are diuretics. Urinary retention may result from anticholinergics, narcotics, antidepressants, sedatives, and alpha-adrenergic agonists. Uncommonly, alpha-adrenergic blockers may cause stress incontinence. Voiding dysfunction attributable to concomitant medication usually can be managed by altering medication type, discontinuing medication, or modifying the dosage schedule when appropriate.

Many elderly patients with OAB suffer from nocturia, resulting in sleep deprivation and significantly impacting quality of life. The etiology of nocturia in older individuals is often multifactorial. Men with BPH often complain of nocturia. Many elderly patients experience a nighttime diuresis as a result of renal tubular dysfunction or from fluid mobilization from their lower extremities; this may occur in the absence of overt pitting edema on physical examination. In others, nocturia may be due to changes in sleep habits, sleep apnea, or as a result of an overactive bladder.

Physical Examination

The most important aspect of the physical examination in women with OAB is the pelvic examination, during which the patient is evaluated for the presence of stress incontinence. Many elderly women who deny stress incontinence have pelvic floor weakness and stress incontinence on examination. Patients should also be evaluated for the presence of pelvic organ prolapse, which can be managed with either a pessary or reconstructive surgery. The degree of vaginal mucosal atrophy in postmenopausal women should be evaluated because local estrogen replacement therapy can improve voiding dysfunction as well as bothersome vaginal dryness.

Urinalysis

Urinalysis, either by dipstick or by microscopic examination of the sediment, is recommended in all patients with OAB to screen for the presence of infection, glucosuria, and microscopic hematuria.¹⁷ In the absence of infection, microscopic hematuria (defined as ≥ 3 -5 red blood cells per high-powered field) should be evaluated with a renal radiograph and by cystoscopy to rule out genitourinary pathology, including malignancy. Glucosuria is common in diabetic patients who experience urinary frequency secondary to polyuria. A urine culture is recommended in those with a positive urinalysis or symptoms suggestive of urinary tract infection.

Many elderly women with OAB also report recurrent urinary tract infections. They may be refractory to OAB therapy until their "sensitizing" infections are prevented with the appropriate use of prophylactic antibiotics. One also needs to be cognizant that the urine of approximately 20% of elderly women is chronically colonized with bacteria, and its treatment does not impact voiding symptoms.

Optional Tests

Postvoid residual urine volume. Measurement of the postvoid residual urine volume is optional in the evaluation of women who present with overactive bladder, but should be strongly considered in those at risk of not emptying efficiently (Table 3). Patients who do not empty commonly report urinary frequency and urgency because the "glass is always half full." Measurement of the postvoid residual urine volume can be done by urethral catheterization, by bladder scanner, or by abdominal ultrasound. Most urologists agree that a normal postvoid residual urine volume is less than 100 mL, although residual urine volume between 50 and 100 mL may

be considered mildly elevated in some patients.

Bladder diary. The bladder diary or volume-frequency chart is a simple noninvasive tool used in the evaluation of patients with voiding dysfunction.¹⁹ Patients are instructed to record fluid intake and the time and volume of each void for 3 to 5 days. The bladder diary has both diagnostic and therapeutic relevance. The recording of urgency or a Valsalva maneuver associated with each incontinence episode can help the physician differentiate between urge and stress incontinence. The severity of urinary frequency and incontinence can also be determined. One can readily diagnose increased urinary frequency secondary to excessive fluid intake and polyuria, and it is paramount in making the diagnosis of nocturia secondary to a nocturnal diuresis. The bladder diary provides both patients and physicians with important feedback during treatment, which can have a beneficial effect in their therapy.

Treatment

The majority of elderly patients with overactive bladder can be effectively

Table 3
Risk Factors for an Elevated Postvoid Residual Urine Volume

- Men with overactive bladder
- Failed medical therapy
- Significant obstructive voiding symptoms
- Feeling of incomplete emptying
- Recurrent urinary tract infections
- History of urinary retention
- Presence of neurogenic bladder or neurologic risk factor
- Elevated serum creatinine
- Hydronephrosis

managed with a combination of non-pharmacologic and pharmacologic approaches, although each can be successfully used alone. Nonpharmacologic treatment options include dietary and fluid modifications, behavioral therapy, and pelvic floor muscle rehabilitation.

Nonpharmacologic Therapy

The recommended fluid intake for patients with OAB is approximately 1.5 to 2 L/day; the author instructs patients to drink 6 or 7 8-oz. glasses of fluid daily. Many elderly patients instinctively reduce fluid intake in an attempt to manage their symptoms. Not only can this result in chronic dehydration, but highly concentrated

urine can be irritating to the lining of the bladder, worsening OAB symptoms. Dehydration is especially common in the elderly and nursing home populations, aggravating both OAB and constipation.²⁰ In addition, patients should be instructed to reduce the intake of common bladder irritants, including caffeine, alcohol, and carbonated beverages.

Patients with OAB can be effectively managed with bladder retraining and pelvic floor rehabilitation exercises. Bladder retraining is designed to increase the time interval between voids in order to establish a normal frequency of urination—its efficacy in reducing incontinence episodes in older, community-dwelling women has been well established.²¹ Pelvic floor rehabilitation has also been shown to be effective in women with OAB; a strong pelvic floor can prevent urge incontinence caused by involuntary bladder contractions. In a randomized, placebo-controlled trial, 197 women, aged 55 to 92 years, with

Pharmacologic Therapy

Antimuscarinic agents are currently the treatment of choice in the management of OAB.²³ A number of newer, longer-acting agents exist and have been studied in the elderly. In order to maximize care, health care providers should be familiar

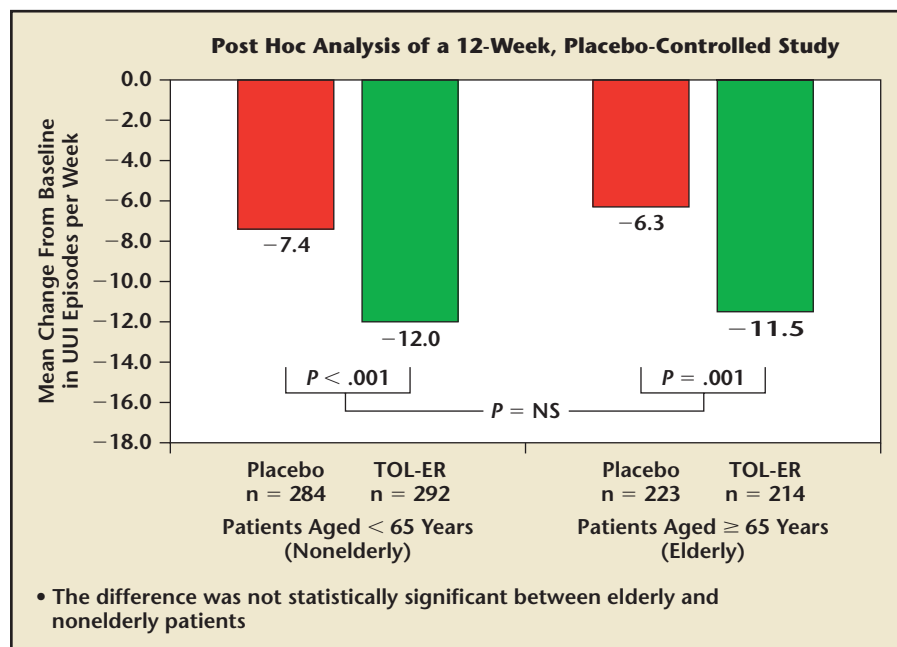
with the data in order to better select agents and to use them appropriately. Some of the more important

trials evaluating the efficacy and tolerability of these agents in older patients are presented. The efficacy and tolerability of extended-release tolterodine (TOL-ER) in older (≥ 65 years) and younger (<65 years) patients were evaluated in a double-blind, placebo-controlled clinical trial.²⁴ One thousand fifteen patients (43.1% ≥ 65 years) were evaluated; mean age in the older and younger cohorts was 74 and 51 years, respectively. The mean reduction in urge incontinence episodes per week in older patients was 11.5 for TOL-ER versus 6.3 for placebo ($P < .001$), and the reductions were similar between older and younger patients (Figure 1). In addition, the reduction in urge incontinence episodes experienced by those older than 75 years was similar to other age groups. Dry mouth was the most common adverse event experienced with TOL-ER (< 65 years, 22.7%, and ≥ 65 years, 24.3%). The incidence of central nervous system (CNS) side effects (including dizziness,

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Figure 1. Reduction in urge incontinence episodes in elderly and nonelderly patients treated with 4 mg extended-release tolterodine. UUI, urgency urinary incontinence. Data from Zinner NR et al.²⁴



somnolence, and abnormal vision) was low for elderly and younger patients, and was comparable to placebo.

In a 12-week, double-blind, placebo-controlled study, the efficacy, tolerability, and safety of TOL-ER (4 mg) was demonstrated irrespective of age.

In a 12-week, single-arm, open-label study named Identification of Men With a Genetic Predisposition to Prostate Cancer: Targeted Screening in *BRAC1* and *BRAC2* Mutation Carriers and Controls (IMPACT), elderly patients 65 years and older treated with TOL-ER were asked in a validated questionnaire whether their bladder condition improved.²⁵ Patients reported significant improvements in their bladder condition, with median percentage improvements of 83% for urgency, 76% for nocturnal frequency, 68% for daytime frequency, and 63% for urge urinary incontinence.

The efficacy, tolerability, and safety of darifenacin were evaluated in a subgroup analysis of elderly patients from 3 phase III, randomized, double-blind clinical trials.²⁶ Three hundred seventeen patients aged 65 or older with overactive bladder received darifenacin 7.5 mg or 15 mg daily, or matching placebo. The median reduction in urge incontinence episodes per week with 7.5 mg and 15 mg was 66.7% and 75.9%, respectively, and both doses were significantly superior to placebo (both $P < .001$). The most common treatment-related adverse events were dry mouth (7.5 mg, 20.6%; 15 mg, 30.9%; placebo, 4.5%) and constipation (7.5 mg, 18.6%; 15 mg, 23.6%; placebo, 6.4%). The incidence of CNS side effects was low and equal to placebo.

Results of this phase III subanalysis study demonstrate the efficacy, tolerability, and safety of darifenacin 7.5 mg and 15 mg in older patients with OAB. There were few withdrawals due to treatment-related adverse events.

A pooled analysis of elderly patients (≥ 65 years) from 4 12-week, double-blind, phase III, randomized, placebo-controlled trials and from a 40-week, open-label, flexible-dose extension trial was performed to evaluate the efficacy and tolerability of solifenacin 5 and 10 mg in the elderly.²⁷ The mean age of the subjects in the double-blind and open-label studies was 71.9 and 71.2 years, respectively. In the placebo-controlled trials, the mean change from baseline in the number of incontinence episodes per 24 hours was -1.5 and -1.9 for subjects receiving 5 and 10 mg solifenacin, respectively (vs -1.0 with placebo; $P = .013$ for 5 mg, $P < .001$ for 10 mg). During the 40-week extension trial, subjects maintained improvements in number of incontinence episodes. Dry mouth was reported in 13.5%, 29.7%, and 4.5% of patients treated with solifenacin 5 mg, 10 mg, and placebo, respectively. Significant CNS side effects were not reported.

In this extensive subanalysis of elderly patients from multiple trials, solifenacin 5 mg and 10 mg were both shown to be statistically superior to placebo in reducing the symptoms of OAB. Efficacy was maintained in the open-label study. Both doses were well tolerated.

In the Multicenter Assessment of Transdermal Therapy in Overactive Bladder With Oxybutynin (MATRIX) study, effects of the oxybutynin transdermal system (OXY-TDS; 3.9 mg/day) on health-related quality of life and safety were evaluated.²⁸ In this open-label, prospective 6-month trial, 2878 adults were enrolled, including 699 patients aged 75 years or older. Validated questionnaires, including the King's Health Questionnaire (KHQ), were used to evaluate the impact of OAB and treatment on quality of life. At study end, all KHQ

domain scores significantly improved for the entire study population ($P < .0001$), except for General Health Perception. There were no significant differences in response between patients older than 75 and younger than 75 in most KHQ domains, including Incontinence Impact, Role Limitations, and Symptom Severity.²⁹

MATRIX enrolled 131 patients aged 85 years or older, median age 88 years.²⁹ Comorbidities were cardiovascular (68%), musculoskeletal (57%), gastrointestinal (41%), neurologic (21%), renal (21%), respiratory (16%), and dermatologic (15%). At enrollment, 83% of patients were taking multiple medications; 19% were taking more than 10 (Figure 2). Substantial improvements occurred in multiple KHQ domains; the most commonly reported treatment-related adverse events were application-site erythema, pruritus, and irritation, occurring respectively in 5.3%, 4.6%, and 3.1% of patients. The rate of skin adverse events was comparable to that of the entire population and significantly lower than previously reported in earlier phase III studies, presumably due to improved skin care and education.³⁰ The prevalence of treatment-related adverse events was lower among patients aged 85 years or older (22.1%) than among the

Figure 2. Concomitant medications used by participants aged 85 years or older. Reprinted with permission from Ruscin JM et al.³²

Number of Concomitant Medications	Participants, n (%) (n = 131)
0 to 1	22 (16.8)
2 to 5	46 (35.1)
6 to 10	38 (29.0)
11 to 15	18 (13.7)
> 15	7 (5.3)

overall study population (30.0%). Of the 2878 participants who received at least 1 dose of medication, CNS side effects were minimal (dizziness [0.7%], somnolence [0.3%], and confusion [0.1%]).

The MATRIX study demonstrated that OXY-TDS improved quality of life and was well tolerated and safe. For a number of reasons, OXY-TDS appears to be an ideal treatment of OAB in the elderly. Transdermal administration essentially bypasses the presystemic hepatic and intestinal metabolism of oxybutynin, dramatically reducing the amount of *N*-desethyloxybutynin absorbed into the systemic circulation. This translates into improved tolerability, with dry mouth and constipation rates similar to placebo,³⁰ and reduces the concern of increased anticholinergic burden in polypharmacy patients. Its twice weekly application may improve patient compliance and some older patients prefer a patch over a pill, especially if they are already taking multiple oral medications. In the MATRIX study, 79.7% of participants were satisfied or very satisfied with its ease of use, and 62.3% believed that OXY-TDS provided additional benefits over prior oral therapies in terms of overall satisfaction.³¹

Referral Guidelines

In order to maximize therapy in elderly patients with OAB, health care providers need to be cognizant of when to refer patients to specialists who have expertise in treating men and women with voiding dysfunction (Table 4). More sophisticated diagnostic studies are often recommended, including urodynamics and cystoscopy. A number of treatments are available to those who do not reach their treatment goal with medication, including biofeedback, neuromodulation, and botulinum toxin injection therapy.

Uncertain diagnosis. When the diagnosis of OAB is in question or the physician is uncomfortable (or not interested) in managing the patient with OAB, referral to a specialist is important to optimize therapy.

Microscopic or gross hematuria. All patients with hematuria not due to a urinary tract infection or a renal stone should be evaluated with an upper tract radiograph and cystoscopy. Patients with an unexplained distant history of gross hematuria should be investigated even if their most recent urinalysis is negative.

Suspected diagnosis of bladder carcinoma. Patients suspected of having bladder cancer or carcinoma

Table 4
Referral Guidelines

- Uncertain diagnosis
- Microscopic or gross hematuria
- Suspected diagnosis of bladder carcinoma
- Symptoms refractory to medical therapy
- Complicating factors
- Men with OAB symptoms refractory to alpha-adrenergic antagonists

OAB, overactive bladder syndrome.

in situ should be referred for further assessment and therapy.

Symptoms refractory to medical therapy. It is recommended to refer patients with OAB refractory to medication because it may have both diagnostic and therapeutic implications. Patients who improve on therapy, but who have not reached their treatment goal, can often benefit from a specialist evaluation and treatment.

Complicating factors. Complicating factors, including the presence of neurologic disease, recent pelvic or genitourinary surgery, recurrent urinary tract infections, and pelvic pain, should prompt one to consider referral. Patients with obstructing voiding

Main Points

- Overactive bladder syndrome (OAB) is a chronic, debilitating condition and constellation of lower urinary tract symptoms, including urinary urgency, with or without urge incontinence, usually associated with frequency and nocturia. It is especially prevalent in the elderly.
- Overactive bladder syndrome is vastly underreported by those who suffer from it.
- The office-based workup of elderly patients with symptoms of OAB should include a complete medical history and physical examination, as well as a urinalysis. Optional evaluation tools include measurement of postvoid residual urine volume and a bladder diary.
- Nonpharmacologic treatment options include dietary and fluid modifications, behavioral therapy, and pelvic floor muscle rehabilitation.
- Antimuscarinic agents are currently the treatment of choice in the management of overactive bladder syndrome.
- The MATRIX study demonstrated that the oxybutynin transdermal system improved quality of life and was well tolerated and safe.

patterns and those with elevated postvoid residual urine volumes also need more complex evaluations.

Men with OAB symptoms refractory to alpha-adrenergic antagonists. A significant percentage of men with lower urinary tract symptoms do not respond to alpha-adrenergic antagonists and suffer from persistent urinary frequency, urgency, and urge incontinence. Many of these men have OAB and can benefit from anticholinergic agents.

Conclusions

Overactive bladder is exceedingly common in both elderly men and women, but it is not a normal consequence of aging. It is likely that its adverse effects on quality of life are even more pronounced in the elderly. Effective management of older patients is dependent upon an accurate diagnosis, as well as appropriate utilization of both pharmacological and nonpharmacological therapies. ■

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